

What is claimed is:

1. A hydrogen containing unit for disposition in a hydrogen fuel source device, the device having a first chamber for housing hydrogen-containing material, a second chamber for housing a liquid reactant adapted to react with the hydrogen-containing material to release hydrogen therefrom, and structure for facilitating flow of the reactant from the second chamber to the first chamber, the hydrogen-containing material comprising:

a wick comprising a coiled ribbon of liquid transporting material; and

a layer of a hydrogen-containing material disposed on said ribbon and coiled therewith;

wherein liquid reactant contacting said wick is transported by said wick into interior portions of said first chamber to reach interior portions of said hydrogen-containing material.

2. The hydrogen containing unit in accordance with claim 1 wherein said liquid transporting material comprises glass cloth.

3. The hydrogen containing unit in accordance with claim 1 wherein said hydrogen-containing material is a metal hydride.

4. The hydrogen containing unit in accordance with claim 2 wherein said hydrogen-containing material is a metal hydride.

5. A hydrogen fuel source comprising:

a first chamber;

a second chamber;

a hydrogen-containing material disposed in said first chamber;

a reactant disposed in said second chamber, the reactant being adapted to react with the hydrogen-containing material to cause release of hydrogen;

a discharge conduit extending from said first chamber for release of hydrogen from said first chamber;

a transfer conduit interconnecting said first and second chambers for flowing the reactant from said second chamber to said first chamber;

a check valve mounted in said transfer conduit and adapted to open upon decrease in pressure in said first chamber from a selected pressure and adapted to close upon the pressure in said first chamber rising to the selected pressure;

a pressurizer acting upon said reactant in said second chamber to maintain said reactant at the selected pressure;

wherein upon opening of said check valve the reactant in said second chamber is urged by said pressurizer to flow through said transfer conduit into said first chamber to react with the hydrogen-containing material to release hydrogen until the selected pressure in said first chamber is restored, thereby to close said check valve and to stop the flow of reactant material into said first chamber; and

wherein said hydrogen-containing material comprises at least one disc of said material, said disc having a central orifice therethrough, and a sparging tube embedded therein and in communication with said central orifice, said sparging tube being provided with a plurality of

holes, such that reactant admitted to said central orifice flows through said sparging tube and said sparging tube holes to said hydrogen-containing material.

6. A hydrogen containing unit for disposition in a hydrogen fuel source device, the device having a first chamber for housing hydrogen-containing material, a second chamber for housing a liquid reactant adapted to react with the hydrogen-containing material to release hydrogen therefrom, and structure for facilitating flow of the reactant from the second chamber to the first chamber, the hydrogen-containing unit comprising:

a disc of hydrogen-containing material, said disc defining a central orifice therethrough; and

a reactant distribution structure embedded in said disc and in communication with the central orifice;

wherein liquid reactant flowed into the central orifice further flows into said distribution structure for distribution throughout said disc.

7. The hydrogen-containing unit in accordance with claim 6 wherein said reactant distribution structure comprises a tube having holes therein.

8. The hydrogen-containing unit in accordance with claim 6 wherein said reactant distribution structure comprises a hollow diskette having holes therein.

9. A hydrogen fuel source comprising:

a first housing defining a first chamber;

a first connector disposed on said first housing;

a second housing defining a second chamber;

a second connector disposed on said second housing;

a hydrogen-containing material disposed in the first chamber;

a reactant disposed in the second chamber, the reactant being adapted to react with the hydrogen-containing material to cause release of hydrogen;

a discharge conduit extending from said first chamber for
release of hydrogen from said first chamber;

a hub member having therein a transfer conduit for
communication between the first and second chambers,
and a check valve in the transfer conduit, said hub
member further having first and second connectors
thereon;

wherein said first housing first connector is releasably
attachable to said hub member first connector, and said
second housing second connector is releasably
attachable to said hub member second connector;

whereby said first and second housings are connectable to and
disconnectable from said hub member.

10. The hydrogen fuel source in accordance with claim 9 and
further comprising an on/off actuator mounted on said hub member
and operative to open and close said check valve.

11. The hydrogen fuel source in accordance with claim 9 wherein
said hydrogen-containing material comprises:

a disc of hydrogen-containing material, said disc having a central orifice therethrough; and

a reactant distribution structure embedded in said disc and in communication with the central orifice;

wherein liquid reactant flowed into the central orifice further flows into said distribution structure for distribution throughout said disc.

12. The hydrogen fuel source in accordance with claim 11 wherein said reactant distribution structure comprises a tube having holes therein.

13. The hydrogen fuel source in accordance with claim 11 wherein said reactant distribution structure comprises a hollow diskette having holes therein.

14. The hydrogen-containing unit in accordance with claim 6 wherein said unit further comprises rigid separator coverings disposed on flat surfaces of said disc.

15. The hydrogen-containing unit in accordance with claim 14 wherein said separator coverings are a selected one of steel and teflon.

16. The hydrogen-containing unit in accordance with claim 8 wherein said diskette comprises first and second steel plates joined together at their peripheries but otherwise spaced from each other to form an internal compartment in communication with said hydrogen-containing material by way of said holes.

17. The hydrogen fuel source in accordance with claim 9 wherein said connectors are threaded for threaded interconnection between said hub member and said first housing, and between said hub member and said second housing.

18. A hydrogen fuel source comprising:

a first chamber disposed in a first housing;

a second chamber disposed in a second housing;

a hydrogen-containing material disposed in said first chamber;

a reactant disposed in said second chamber, the reactant being adapted to react with the hydrogen-containing material to cause release of hydrogen;

a discharge conduit extending from said first chamber for
release of hydrogen from said first chamber;

a transfer conduit interconnecting said first and second
chambers for flowing the reactant from said second
chamber to said first chamber;

a check valve mounted in said transfer conduit and adapted to
open upon decrease in pressure in said first chamber
from a selected pressure and adapted to close upon the
pressure in said first chamber rising to the selected
pressure;

a pressurizer disposed in said second housing for acting upon
said reactant in said second chamber to maintain said
reactant at the selected pressure;

wherein upon opening of said check valve the reactant in said
second chamber is urged by said pressurizer to flow
through said transfer conduit into said first chamber
to react with the hydrogen-containing material to
release hydrogen until the selected pressure in said
first chamber is restored, thereby to close said check
valve and to stop the flow of reactant material into
said first chamber;

wherein said pressurizer is a gas under pressure in said
second housing and acting on said second chamber and
thereby said reactant, and

wherein said second housing is provided with a gas charging
valve for flowing gas into said second housing to bear
upon said second chamber to establish the selected
pressure.

19. The hydrogen fuel source in accordance with claim 12 wherein
said tube is coiled in said disc.

20. A hydrogen fuel source comprising:

a first chamber;

a second chamber;

a hydrogen-containing material disposed in said first
chamber;

a reactant disposed in said second chamber, the reactant
being adapted to react with the hydrogen-containing
material to cause release of hydrogen;

a discharge conduit extending from said first chamber for
release of hydrogen from said first chamber;

a transfer conduit interconnecting said first and second
chambers for flowing the reactant from said second
chamber to said first chamber;

a check valve mounted in said transfer conduit and adapted to
open upon decrease in pressure in said first chamber
from a selected pressure and adapted to close upon the
pressure in said first chamber rising to the selected
pressure;

a pressurizer acting upon said reactant in said second
chamber to maintain said reactant at the selected
pressure;

wherein upon opening of said check valve the reactant in said
second chamber is urged by said pressurizer to flow
through said transfer conduit into said first chamber
to react with the hydrogen-containing material to
release hydrogen until the selected pressure in said
first chamber is restored, thereby to close said check

valve and to stop the flow of reactant material into
said first chamber;

wherein said hydrogen-containing material comprises a metal
hydride; and

wherein said metal hydride comprises a metal hydride selected
from a group of metal hydrides consisting of lithium
hydride, lithium aluminum hydride, calcium hydride,
sodium hydride, magnesium hydride, Group 1A metal
hydrides, borohydrides of Group 1A metals, and Group
11A metal hydrides.

21. The hydrogen fuel source in accordance with claim 9 wherein
said hydrogen-containing material comprises a plurality of discs
of hydrogen-containing material, said discs each having an orifice
therethrough and a reactant distribution structure embedded in
said disc and in communication with said orifice, said orifice
being adapted for communication with a distribution structure in
at least one other of said discs, and in communication with a
common duct.

22. The hydrogen fuel source in accordance with claim 11 wherein
said reactant distribution structure comprises at least one tube
having holes therein, and extending from said orifice.